

217/782-2113

CONSTRUCTION PERMIT

PERMITTEE

Abbott Labs North Chicago Facility  
Attn: Daniel Wozniak, Manager-Air Compliance  
1401 Sheridan Road  
North Chicago, Illinois 60064

Application No.: 02100023

I.D. No.: 097125AAA

Applicant's Designation:

Date Received: October 9, 2002

Subject: Boilers 10 and 11

Date Issued: March 26, 2003

Location: 1401 Sheridan Road, North Chicago

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of two boilers as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1.0 Unit Specific Conditions

1.1 Description

The new boilers, 10 and 11, are fired primarily with natural gas. In addition, the boilers will use biogas from Abbott's wastewater treatment plant as fuel (Odorous Air, generated from the wastewater treatment plant and certain fermentors, is used as supplemental combustion air for any combination of Boilers #4, 6, 9, 10 and 11). Distillate oil will be used as a backup fuel. These new boilers are intended to replace two coal (7 and 8) and two natural gas (T1 and T3) boilers.

1.2 List of Emission Units and Pollution Control Equipment

Emission Units	Description	Emission Control Equipment
Boiler #10	220 mmBtu/Hr Natural Gas, Distillate Oil, and Biogas	Flue Gas Recirculation
Boiler #11	174 mmBtu/Hr Natural Gas, Distillate Oil, and Biogas	Flue Gas Recirculation

1.3 Applicability Provisions and Applicable Regulations

- a. The affected boilers for the purpose of these unit-specific conditions are the fuel combustion emission units described in Conditions 1.1 and 1.2.
- b. No person shall cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from each affected boiler pursuant to 35 IAC 212.123(a), except as allowed by 35 IAC 212.123(b) and 212.124.

Note: A more stringent standard applies pursuant to the NSPS once an affected boiler burns oil.

- c. The affected boilers are subject to the NSPS for Industrial-Commercial-Institutional Steam Generating Units, 40 CFR 60 Subparts A and Db. The Illinois EPA is administering the NSPS in Illinois on behalf of the USEPA under a delegation agreement. The Permittee shall comply with all applicable standards of the NSPS on and after the date on which the performance test is completed or required to be completed under 40 CFR 60.8, whichever date comes first:

- i. Standard for Sulfur Dioxide

Pursuant to 40 CFR 60.42b(j)), The Permittee shall only use very low-sulfur oil, as defined by the NSPS, i.e. less than 0.5 % by wt, in the affected boilers.

The Permittee shall demonstrate that the oil meets the definition of very low sulfur oil by maintaining fuel receipts as described in 40 CFR 60.49b(r) [40 CFR 60.42b(j) (2)].

If fuel oil receipts are not obtained as described in 40 CFR 60.49b(r), then the Permittee shall demonstrate that the oil meets the definition of very low sulfur oil by following the performance testing and monitoring procedures as described in 40 CFR 60.42b(j) (1).

- ii. Standard for Opacity

Pursuant to 40 CFR 60.43b(f) and 60.46b(a), each affected boiler shall not discharge into the atmosphere any gases that exhibit greater than 20 percent opacity (6-minute average), except for one 6-minute period per hour of not more than 27 percent opacity. This requirement becomes applicable when a boiler first burns oil. Thereafter, this standard applies at all times except periods of startup, shutdown or malfunction.

- iii. Standard for Nitrogen Oxides

Pursuant to 40 CFR 60.44b(d) and 40 CFR 60.46b(a), the emissions of nitrogen oxides (NO<sub>x</sub>) from each affected boiler shall not exceed 0.20 lb/mmBtu. This standard, which applies as a rolling average over 30 boiler operating days, applies at all times.

Note: This permit is issued based on the boilers being of high heat release design. If the boilers are changed to low-heat release design, the applicable standard is 0.10 lb NO<sub>x</sub>/mmBtu.

- d. The affected boilers shall comply with the following state emission standards:
  - i. Pursuant to 35 IAC 212.206 and 212.207(a), emissions of particulate matter into the atmosphere in any one hour period from each affected boiler attributable to the combustion of distillate oil shall not exceed 0.1 lb/mmBtu.
  - ii. Pursuant to 35 IAC 214.122(b), the sulfur content of distillate oil fired in each affected boiler shall not exceed a level that is equivalent to a sulfur dioxide (SO<sub>2</sub>) emission rate of 0.3 lbs/mmBtu.
  - iii. The emission of carbon monoxide (CO) into the atmosphere from each affected boiler shall not exceed 200 ppm, corrected to 50 percent excess air [35 IAC 216.121].
- e. The affected boilers will be subject to the NESHAP, 40 CFR 60 Subpart DDDDD upon its promulgation. The Illinois EPA is administering the NESHAP in Illinois on behalf of the USEPA under a delegation agreement. The Permittee shall comply with all applicable standards of the NESHAP.

#### 1.4 Non-Applicability of Regulations of Concern

None

#### 1.5 Operational and Production Limits and Work Practices

- a. At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected boilers including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Illinois EPA and/or USEPA which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source [40 CFR 60.11(d)].
- b. Natural gas, distillate oil and biogas from the on-site wastewater treatment plant shall be the only fuels fired in the affected boilers.

- c. Fuel usage for the affected boilers shall not exceed:

Usage	Distillate Oil (Million Gallons)	Biogas (Million scf)
Monthly	2.0	8.8
Annually	23.6	105.2

#### 1.6 Emission Limitations

- a. i. Emissions from the utilities area, which includes boilers #5, 6, 9, T5, 10 and 11, and gas Turbine #1, shall not exceed the following aggregate emission limitations:

<u>Pollutant</u>	<u>Emissions</u>	
	<u>(Ton/Mo)</u>	<u>(Ton/Yr)</u>
PM <sub>10</sub>	17.0	136.4
SO <sub>2</sub>	130.0	860.4
VOM	1.40	14.0
CO	31.0	310.5
NO <sub>x</sub>	50.0	468.3

1. The above aggregate emission limitations revise limitations established for units in the utilities department in the source's CAAPP permit, No. 96010011. These revisions, as demonstrated in Attachment 1, continue to ensure that the construction of the affected boilers does not constitute a major modification pursuant to the federal rules for Prevention of Significant Deterioration (PSD), 40 CFR 52.21 and the states rules for Major Stationary Source Construction and Modification, 35 IAC Part 203.
  2. For purposes of determining emissions to demonstrate compliance with these limits, emissions from affected boilers shall be determined as specified by this permit including continuous emissions monitoring for NO<sub>x</sub>. For existing units emissions shall be determined in accordance with the provisions of the source's CAAPP permit.
- b. The Permittee shall remove existing boilers f#T1 and #T3 shall be removed from service after both affected boilers have completed shakedown and begin normal operation.

- c.
  - i. The combined total VOM emissions from the Building R3 Tanks #44, #45, and #46 shall not exceed 0.84 tons/year. The total VOM emissions from Building M6 operations shall not exceed 2.925 tons/year. This condition represents new limits for certain VOM emission units that were developed during the review of contemporaneous VOM emissions increases and decreases with this project.
  - ii. The Permittee shall keep records for the operation and emissions of these units to demonstrate compliance with the above limits.
- d. Compliance with annual limits in this permit shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

#### 1.7 Testing Requirements

The Permittee shall fulfill the following testing requirements for each affected boiler.

- a. The Permittee shall conduct an initial performance test for opacity as required under 40 CFR 60.8 using the following procedures and reference methods[40 CFR 60.46b(d)]
  - i. Method 9 is used for determining the opacity of stack emissions. [40CFR60.46(b)(d)(7)]
- b. The Permittee shall conduct performance tests for NO<sub>x</sub> emissions, as required under 40 CFR 60.8 using the continuous system for monitoring NO<sub>x</sub> under 40 CFR 60.48b(b) as specified by 40 CFR 46b(e).
- c.
  - i. The Permittee shall conduct emission tests for CO and VOM emissions during the period of time when the initial performance tests for NO<sub>x</sub> are performed. The tests for VOM may be performed on one boiler, as randomly selected by the Illinois EPA.
  - ii. The Permittee shall also perform emission tests for CO and VOM upon written request from the Illinois EPA.

#### 1.8 Monitoring Requirements

The Permittee shall comply with the following monitoring requirements for each affected boiler.

- a. Fuel Monitoring

- i. The Permittee shall obtain fuel receipts for distillate oil as described in 40 CFR 60.49b(r). [40 CFR 60.47(b) (f)]

If distillate fuel oil receipts are not obtained from the supplier as described in 40 CFR 60.49b(r), then the Permittee shall comply with the monitoring procedures described in 40 CFR 60.47b(a) or 40 CFR 60.47b(b) to determine sulfur dioxide emission rate of fuel oil sulfur content [40 CFR 60.42b(j) (1)].

- ii. The Permittee shall measure the sulfur content ( $H_2S$  concentration) and heat content of representative samples of biogas on a regular basis, as required by the CAAPP permit.

b. Opacity Monitoring

The Permittee shall install, calibrate, maintain, and operate a continuous monitoring system for measuring the opacity of the exhaust discharged to the atmosphere and record the output of the system. [40 CFR 60.48(b) (a)]

c. Emissions Monitoring for Nitrogen Oxides

The Permittee shall install, calibrate, maintain and operate a continuous monitoring system, and record the output of the system, for measuring nitrogen oxides emissions discharged to the atmosphere.

- i. The continuous monitoring system shall be operated and data recorded during all periods of operation of the affected facility except for continuous monitoring system breakdowns and repairs. Data is recorded during calibration checks, and zero and span adjustments. [40 CFR 60.46(b) (c) and 60.48(b)]

1.9 Recordkeeping Requirements

- a. The Permittee shall keep on file design data for each affected boiler to demonstrate that it is of high heat release design.
- b. The Permittee shall maintain records of the following items for the affected boilers to demonstrate compliance with Conditions 1.5 and 1.6:
  - i. The Permittee shall record and maintain records of the amount and type of fuel combusted during each day for each affected boiler.

- ii. Monthly and annual aggregate NO<sub>x</sub>, CO, PM, SO<sub>2</sub>, and VOM emissions from the affected boilers. For NO<sub>x</sub>, these records shall be based on NO<sub>x</sub> continuous emissions monitor. For SO<sub>2</sub>, these records shall be based on fuel oil sampling and analysis or vendor analytical certification for distillate oil and biogas flow and sulfur content while firing biogas for other pollutants, based on fuel consumption and type and the applicable emission factors, with supporting calculations.
- c. The Permittee shall maintain the applicable records required by 40 CFR 60.49b for each affected boiler, including records of operation of the boiler, records demonstrating use of only very low sulfur oil, records of opacity and operation of the opacity monitoring system, and records of NO<sub>x</sub> emissions and operation of the NO<sub>x</sub> monitoring system. The opacity records required by 40 CFR 60.49b shall be used to demonstrate compliance with the opacity standards specified in Condition 1.3(b).

#### 1.10 Notification and Reporting Requirements

- a. The Permittee shall notify the Illinois EPA of the following dates:
  - i. The date construction of each affected boiler commenced postmarked no later than 30 days after such date, pursuant to 40 CFR 60.7(a)(1).
  - ii. The anticipated date of initial startup of each affected boiler postmarked not more than 60 days nor less than 30 days prior to such date, pursuant to 40 CFR 60.7(a)(2).
  - iii. The actual date of initial startup of each affected boiler postmarked within 15 days after such date, pursuant to 40 CFR 60.7(a)(3), which shall include the information specified by 40 CFR 60.49b(a)
- b. The Permittee shall submit to the Illinois EPA the performance test data from the initial performance test and the performance evaluation of the opacity monitors and NO<sub>x</sub> CEMS using the applicable performance specifications in Appendix B. [40 CFR 60.49b(b)]
- c. The Permittee shall fulfill applicable reporting requirements of the NSPS for each boiler with regular reports submitted to the Illinois EPA that include:
  - i. For opacity, the information specified under 40 CFR 60.7(c);

- ii. For NO<sub>x</sub>, the information specified under 40 CFR 60.7(c) and 40 CFR 60.49b. [40 CFR 60.49b(i)]
- iii. For use of very low sulfur oil, a certification that only very low sulfur oil was combusted in the affected boiler during the reporting period.
- d. The Permittee shall promptly notify the Illinois EPA of noncompliance of the affected boilers with the permit requirements as follows. Reports shall describe the probable cause of such deviations, and any corrective actions or preventive measures taken:
  - i. Fuel usage from the affected boilers in excess of the limits specified in Condition 1.5.
  - ii. Emissions in excess of the limits specified in Condition 1.6.

In addition to the conditions herein, general requirements of the CAAPP permit with respect to retention and availability of records and/or submission of reports shall apply to recordkeeping and reporting requirements established by this permit.

Please note the Permittee is allowed to operate the affected boilers under this construction permit as allowed by the CAAPP permit until final action is taken on a revision to or renewal of their CAAPP permit.

If you have any questions on this, please call Kevin Smith at 217/782-2113.

Donald E. Sutton, P.E.  
Manager, Permit Section  
Division of Air Pollution Control

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cc: Region 1



Attachment 1  
NSR Applicability

**Table I - Contemporaneous VOM Emission Changes**

<b>Project Description</b>	<b>Date Issued</b>	<b>VOM Change (TPY)</b>
R-7A Chromatography Feed Tank	Jan 98	0.10
Fermentor and Seed Tank Replacements	Jan 98	- 1.76
Building C-11 East Reactor	Mar 98	0.22
Building C-10 Equip. Replacement for PC860	May 98	0.22
Utilities Division	Oct 98	1.51
Evap. with Condenser and Vac. Pump (Cyclo. R-10)	Oct 98	- 0.2836
S-30 Tank Farm Tanks TA-9602 and TA-9705	Oct 98	0.044
R-9 PC952 Centrifuge Dryer and Cogeim Dryer	Dec 98	0.50
C2 Tank Replacement and C-7A Vacuum System	Dec 98	0.022
Rental Evap (Cyclosporine R-10)	Feb 99	0.018
R-10 Pilot Plant Exp. Equip. and Thermal Ox.	Mar 99	0.66
S-34 Tank Farm (Replacement Tank T-1987)	Jul 99	0.26
Bldg. R12 Unit Operations Lab	Nov 99	0.10
S30 Tank Farm Tank No. 2011	Mar 00	0.1950
M8 Gasoline Tank	Apr 00	0.250
BLDG. R12 Lab No. 3 Fume Hood	Apr 00	0.10
R3 Tanks #44, 45, and 46*	May 00	0.840
M3B PARD Tablet Coater No.2	May 00	0.220
SPD Chem. Pilot Plant Bldg R8, Rm. 150	Dec 00	0.660
Emergency Boiler No. T4	Jan 01	0.055
PPD M2 Line 7 Liquid Products Fill Room	Jan 01	0.063
Building M6 Operations*	Feb 01	2.925
SPD R2B Process Tanks (4)	Feb 01	0.20
SPD R3 50 Gal. Collection Tank	Feb 01	0.220
PPD M3 Weigh Booth #4	Mar 01	0.50
SPD C10, PC-860 Reactor Replacement	Mar 01	0.25
SPD R7 PC-1 and 2 Reactors VOM Increase	Mar 01	1.56
SPD Chem. Area Portable Reactor RX-1616	Apr 01	0.37
SPD R9 PC-951 VOM Increase	Apr 01	0.20
SPD R9 Dryer DR-920 Replacement	Apr 01	0.24
SPD C10 Tumble Dryer DR-0868 and Vac. System	Apr 01	0.40
SPD S-7 Tank Farm Portable Container Filling	Jul 01	0.050
SPD C10 Drum Washer	Aug 01	0.1
SPD Shem Mfg. Portable Equipment	Oct 01	0.2
SPD C10 PC-803 Reactor and Process Condenser	Oct 01	0.3
R3 Tank 58 and R3 Tank 92	Oct 01	0.07
R2B Tank 106 and R2B Tank 51	Oct 01	0.07
R5/R6 Cleaning Solution Tank	Oct 01	0.01
Cold Solvent Cleaning Units (3)	Oct 01	0.025
Boiler T5	Jan 02	1.2
SPD Bldg R7A Process Equipment	Jan 02	0.75
GPRD Pilot Plant Sov Purif Proc (12 Units)	Feb 02	0.105
Building C-10, PC-860 Feed Tank	Mar 02	0.08
PPD/GPRD J2 Pharmaceutical Fill/Finish Fac.	Mar 02	0.1
S-27 Tank Farm Modification	Apr 02	2.2
Building C-10, PC-830 Reactor Replacement	Apr 02	0.3725

<b>Project Description</b>	<b>Date Issued</b>	<b>VOM Change (TPY)</b>
Building C-10, PC-806 Reactor Replacement	Apr 02	- 1.487
Building R10 Amicon Column (Amicon OR-2)	Jun 02	0.052
Boiler T-6	Sep 02	0.4430
Building R10 Aurora Filter RAP-02	Nov 02	0.0200
S30 Tank Farm (Tanks 2011 & TA-9910) and Chem. PAL	Nov 02	- 4.7750
<b>NSR TOTAL</b>		<b>10.7439</b>
<b>Minus Utilities Area Emissions</b> (Included in PAL)		
Utilities Division Permit No. 97090028	Oct 98	1.510
Emergency Boiler T4 Permit No. 01010028	Jan 01	0.055
Emergency Boiler T5 Permit No. 01120026	Jan 02	1.20
<b>Total For Purposes of Aggregate Emission Limit</b>		<b>7.9789</b>

\* New limits for existing processes

**Table II**  
**Past Two Year Actual Emissions From the Utility Area**

Emissions From 2000-2001	Total Actual Emissions (Tons)
CO	211.47
NO <sub>x</sub>	429.28
PM <sub>10</sub>	122.41
SO <sub>2</sub>	960.36
VOM	2.93

**Table III**  
**Proposed Aggregate Limit For The Utility Area**

Pollutant	Proposed PAL Limits (tons)
CO	310.47
NO <sub>x</sub>	468.28
PM <sub>10</sub>	136.41
SO <sub>2</sub>	860.36
VOM	14.00

**Table IV**  
**Net Emission Increase**

<b>Pollutant</b>	<b>Table I</b>	<b>- Table II</b>	<b>+ Table III</b>	<b>= Net Change</b>
CO	-----	211.47	310.47	99.00
NO <sub>x</sub>	-----	429.28	468.28	39.00
PM <sub>10</sub>	-----	122.41	136.41	14.00
SO <sub>2</sub>	-----	960.36	860.36	- 100.00
VOM	7.9789	2.93	14.00	19.0489

Note: This table evaluates the maximum net increase in emissions with this project. It is expected that the net increase will be significantly less than these amounts.

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